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ALAMEDA POINT
SSIC NO. 5090.3

Department of Toxic Substances Control

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June 17, 2005

Mr. Thomas L. Macchiarella
Southwest Division Naval Facilities Engineering Command
Attn: Code 06CA.TM
1220 Pacific Highway
San Diego, CA 92132-5190

DRAFT SOIL REMEDIAL INVESTIGATION REPORT, ALAMEDA POINT SITE 30, ALAMEDA, CALIFORNIA

Dear Mr. Macchiarella:

The Department of Toxic Substances Control (DTSC) has reviewed the above referenced document dated March 2005. Enclosed are our comments prepared by the Geological Services Unit (GSU) and Human Health and Ecological Risk Division (HERD). Please contact me at 510-540-3767 or mliao@dtsc.ca.gov if you have any questions.

Sincerely,

Marcia Y. Liao

Marcia Liao
Remedial Project Manager
Office of Military Facilities

Enclosure

Cc: Greg Lorton, SWDiv
Darren Newton, SWDiv
Anna-Marie Cook, EPA
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Department of Toxic Substances Control

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MEMORANDUM

TO: Marcia Liao, Project Manager
Office of Military Facilities
700 Heinz Avenue, Suite 200
Berkeley, California 94710

FROM: Michelle Dalrymple, PG Michelle Dalrymple
Engineering Geologist
Geologic Services Unit

REVIEWED BY: Stewart W. Black, PG
Senior Engineering Geologist
Geologic Services Unit

DATE: June 16, 2005

SUBJECT: **REVIEW OF THE DRAFT SOIL REMEDIAL INVESTIGATION REPORT, IR SITE 30, ALAMEDA POINT, ALAMEDA, CALIFORNIA, DATED MARCH 2005**

ACTIVITY REQUESTED

Per your request the Northern California Geological Services Unit (GSU) has reviewed the *Draft Soil Remedial Investigation Report for IR Site 30, Alameda Point, Alameda, California* dated March 2005. The draft Remedial Investigation (RI) was prepared by Bechtel Environmental, Inc. (Bechtel) for the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command, Southwest Division. GSU has reviewed the document with respect to the geologic and hydrogeologic interpretations, the characterization of nature and extent of contamination, and the conclusions and recommendations presented. Review activities consisted of reading the document and reviewing the file for background issues.

PROJECT SUMMARY

The purpose of the RI report is to present the results, conclusions, and recommendations of the soil RI conducted for IR Site 30. The specific objectives of this RI were to:

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- Characterize the nature and extent of soil contamination;
- Assess risk to human health by performing a human-health risk assessment (HHRA);
- Assess the risk to ecological receptors by completing a Tier-1 screening level ecological risk assessment (ERA).

Groundwater data obtained during the RI were used to provide input for indoor air modeling for the risk assessment and to determinbe whether or not the groundwater contamination beneath IR Site 30 is consistant with an areawide groundwater plume.

GENERAL COMMENTS

A. GSU has noted persistent problems with analytical detection limits for several of the samples submitted for polynuclear aromatic hydrocarbon (PAH), pesticides, and polychlorinated biphenyl (PCB) analyses. It is the opinion of GSU that these problems have not been adequately addressed in this RI report. As noted in Section 3.4.2, *Detection Limits*, and in Section 4.1.2, *Soil Analytical Results*, many of the samples analyzed for PAHs, pesticides, and PCBs, had sample quantitation limits (SQLs) that were well above the target quantitation limits (TQLs) specified in the RI work plan. In addition, SQLs were also above the screening criteria (residential soil preliminary remediation goals [PRGs]) for many of the analytes. It is stated in the nature and extent discussion that, "because the MDLs for these samples are below their respective PRGs, and the laboratory did not report any of these constituents as detected between the SQL and the MDL, the conclusion that these constituents are not present is supported."

GSU questions this statement and requires further clarification in order to determine whether the data from this RI are sufficient to characterize the nature and extent of contamination at IR Site 30. Until the detection limit problem is better characterized and/or resolved, GSU cannot verify if the recommendations presented in this RI report are appropriate.

Recommendation

Please provide an explanation for the elevated detection limits and a more thorough analysis of what percentage of the data are affected. Please explain what might have caused the elevated detection limits and what data gaps may have been created by this problem (see Specific Comments No. 18, 19, and 20).

B. The Johnson and Ettinger (J&E) model for vapor migration into indoor air was used to estimate potential risks associated with contaminated soil and groundwater beneath IR Site 30. Based on GSU's review of Appendix I3 (which presents the J&E modeling results) it appears that the input value for depth below grade to the water table was 5 feet. Input to the model also included the upper two feet of soil as sand, and the lower 3 feet of soil as clay. It is the opinion of GSU that this interpretation of the subsurface conditions at IR Site 30 is not appropriate for the J&E model as it does not provide a conservative estimate of risk. Many of the borings drilled at IR Site 30 encountered only very thin clay layers (1 to 2 feet thick) or no clay at all to depths of 4 to 6 feet below ground surface (bgs). In fact, sands and gravels with varying amounts of fines were often encountered to these depths. As pointed out in Section 6.1.6.2, assuming the presence of clay rather than sand in the J&E Model may cause the risk to be lowered.

In addition, groundwater at IR Site 30 has been encountered as shallow as four feet bgs, and in some cases shallower (see Specific Comment No. 13). It is the opinion of GSU that a water table depth of no greater than 4 feet bgs should be used in the model, and that the lithologic input should be corrected to reflect a more conservative assumption based on site-specific data.

Recommendation

Please revise the input parameters used in the J&E model to provide a more conservative estimate of risk based on site-specific conditions. GSU recommends that estimates of vapor intrusion from VOC-contaminated groundwater include a sensitivity analysis to account for potential migration pathways through different soil types. Please also consider using site-specific values for geotechnical parameters rather than default values, or explain why these data were not used (see Specific Comment No. 14).

C. The RI states that there is a continuous clay layer in the subsurface at IR Site 30 and that this clay layer is an important physical barrier that potentially restricts vertical vapor migration from the shallow groundwater. Based on a review of lithologic logs from IR Site 30, GSU agrees that there is a predominance of clay in the subsurface in many locations at IR Site 30. However, GSU disagrees that the lateral continuity of the clay has been demonstrated. While GSU appreciates the level of effort put forth in interpreting the lithology at IR Site 30, it is the opinion of GSU that the data are insufficient to defend the concept of lateral continuity. Large areas of the site (in particular, beneath existing building structures) were not sampled, so these areas are data gaps with respect to the continuity and thickness of the clay. The clay is absent in at least three boring locations and is very thin (less than 2 feet) in several others.

Recommendation

Please modify or remove any statements regarding the lateral continuity of the clay including the statement that it is an important physical barrier to vertical vapor migration, as this has not been demonstrated and cannot be supported by the current data set.

D. One purpose of collecting groundwater samples from IR Site 30 during the RI was to determine whether the chemicals in groundwater are consistent with those in the areawide plume, or whether a site-specific release of contaminants had occurred. A distinct analysis of groundwater data from IR Site 30 has been made for benzene and naphthalene relative to the areawide groundwater plume. The analysis indicates that the concentrations of these two volatile organic compounds (VOCs) in groundwater are consistent with the areawide plume. Based on the information presented, GSU agrees with this determination. However, the same rigor was not applied for other constituents detected in groundwater samples collected from IR Site 30. It is the opinion of GSU that it has not been demonstrated that other VOCs, PAHs and metals detected in shallow groundwater are not the result of releases from IR Site 30.

Recommendation

Please include additional analyses of the data for all constituents detected in groundwater that were also found in soil at IR Site 30, and describe their relationship to the areawide groundwater plume (see Specific Comment No. 22).

E. In November 2004, a time critical removal action (TCRA) was performed at IR Site 30 as discussed in Section 1.3.7 of the draft RI report. It appears that the TCRA was undertaken based on the findings of the soil RI, but the rationale for the TCRA is not explicitly described or discussed in the RI report. GSU has questions regarding the TCRA with respect to soil and groundwater contamination issues at IR Site 30. Specifically, what were the findings of the RI that triggered the TCRA?

Also, as part of the TCRA, a 5-by-5 area around boring C3S030B068 was removed to a depth of 2 feet bgs. GSU has questions regarding the purpose of this excavation.

Recommendation

Please clarify the purpose of the TCRA and explain what findings triggered this action (see Specific Comment No. 10). Please also explain why the excavation was performed and upon what information the dimensions of

the excavation were based. Please clarify whether any confirmation sampling was performed following the excavation. If so, what type of sampling was performed and what were the results? If not, how was it determined that all contaminated soil had been removed?

SPECIFIC COMMENTS

1. Executive Summary. In the third full paragraph on page ES-1, it is stated that the Navy will recommend an FS to evaluate remedial alternatives for IR Site 30 if this is determined to be necessary. However, on page ES-15 and in Section 7.2 of the draft RI report, it is stated that the Navy recommends that an FS be undertaken to evaluate options to address arsenic in soil at IR Site 30. **GSU recommends revising the first page of the executive summary to reflect the recommendation presented on page ES-15 and in Section 7.2.**

2. Executive Summary. In the last full paragraph on page ES-1, the TCRA performed at IR Site 30 in November 2004 is discussed. It is stated that soil cover materials (synthetic turf, sand, liners, and wood chips) were installed. **Please briefly describe what triggered the TCRA and also mention that soil excavation was performed.**

3. Section 1.1 – Purpose. The purpose stated in the first paragraph in this section indicates that only the analytical results from soil samples collected at IR Site 30 were used to assess risk to human health. However, the purpose of the RI also included the use of analytical results of groundwater samples to evaluate the risk to human health via the indoor air pathway. **Please clarify.**

4. Section 1.3.3 – Site Description and Operations. The first paragraph on page 1-5 discusses a visibly stained area slightly overlapping the far eastern edge of IR Site 30 that stretches east into the vicinity of the Kollman Circle area of Site 25, where another larger stain is also visible. The approximate boundaries of this stain were provided on the site features map (Figure 2-1) in the *Final Sampling and Analysis Plan for the IR Site 30 RI* (BEI, September 2004). In that this stain overlaps the eastern edge of the IR Site 30 boundary, GSU believes that it is important to show this feature on a figure in the main body of the RI report. It is useful to have this information presented on a map so that soil sampling locations in relation to this stain can be evaluated. **GSU requests that the approximate boundaries of the stained area be added to the site features map (Figure 1-4) in the RI report. GSU also requests an explanation as to why samples were not collected from this stained area as part of the RI.**

5. Section 1.3.4 – Operations Adjacent to IR Site 30. In this section it is stated that a RI will be conducted at Site 31, which abuts IR Site 30 to the south. IR Site 31 was historically used for warehousing and DRMO storage. There are historical

data from previous investigations conducted at IR Site 31 that indicate PAH and metals contamination may be present in soil, including investigations conducted in 1987 and 1988 by ERM West. A vapor barrier was apparently installed beneath the Marina Village housing units at IR Site 31 which were built in approximately 1993. **GSU recommends that data from previous investigations conducted at IR Site 31 be evaluated to determine whether activities and/or contamination at this site may have impacted IR Site 30. GSU also recommends that a description of the historical site usage at IR Site 31 and a discussion of the results of previous investigations be added to the RI for IR Site 30.**

6. Section 1.3.4.1 – IR Site 25. The second paragraph in this section discusses a stain that is visible on the aerial photograph from 1968 and refers the reader to a figure in Appendix A for the location relative to IR Site 30. It goes on to say that the materials that produced the stain may be a contributing source to the large, areawide VOC plume that is present beneath IR Site 30 and the adjacent Sites 25 and 31. In that this stain is possibly related to the extensive areawide groundwater contamination and is potentially significant, GSU feels that this stain should be presented on maps within the main body of the RI report. In particular, **please consider adding this feature to the site features map (Figure 1-4), as discussed in Specific Comment No. 4.**

7. Section 1.3.5.3 – Remedial Investigations at OU-5, 2002 OU-5 Remedial Investigation. It is stated in the second to last full paragraph on page 1-9 that soil gas samples were collected at shallow depths from IR Site 30 and analyzed for VOCs. It is also stated that saturated soil conditions precluded the collection of deeper soil gas samples. **Please specify to what depths below ground surface "shallow" and "deeper" refer.**

   It is further stated that benzene, naphthalene, and 12 other VOCs were reported in the shallow soil gas samples. GSU understands that benzene and naphthalene are most likely related to the areawide groundwater plume. However, GSU questions the source of the 12 other VOCs that were reported in these samples. Can it be demonstrated that they are also related to the areawide groundwater plume, or are they unique to IR Site 30. **Please clarify.**

8. Section 1.3.5.6 – Storm Drain Investigation. In GSU's Specific Comment No. 1 on the *Draft Work Plan for Remedial Investigation at IR Site 30* (BEI, 2004), GSU questioned whether the depiction of utilities at the site as presented on the Site Features Map (Figure 2-1 of the draft work plan) was complete. In the Navy's response to this comment, it was stated that additional utility lines were identified and that these new utility lines would be added to Figure 2-1. However, the depiction of utility lines on the Site Features Map (Figure 2-1 of the final work plan, and Figure 1-4 of the draft RI report) is unchanged. **Please update Figure**

1-4 with respect to the new information obtained subsequent to the preparation of the draft RI work plan, as described in the response to comments contained in attachment E of the final RI work plan.

9. Section 1.3.6.2 – Tidal Influence Studies. In the middle of the first paragraph, the text reads, "Consistent tidal fluctuations of 0.03 to 0.08 foot were recorded in the shallow aquifer wells; in shallow aquifer wells consistent tidal fluctuations of 0.08 foot to 1.1 feet were recorded." There appears to be an error in this reported information. **Please clarify.**

10. Section 1.3.7 – Concurrent Time Critical Removal Action. The TCRA was performed at the site as a result of the findings of the soil RI. Therefore, it is the opinion of GSU that the TCRA should be described in greater detail in the RI report. **GSU requests that information is provided to explain what triggered the TCRA. Also, please explain why a 5-by-5 foot area was removed to a depth of 2 feet bgs in the location of boring C3S030B068, and how was it determined that all contaminated soil had been removed (see General Comment E).**

11. Section 2.3.2 – IR Site 30 Geology. The second paragraph on page 2-4 states that the shallowest fill materials (usually the first 3 to 6 feet bgs) were generally yellowish-brown gravels and sands that appeared to be materials imported from other areas (outside of Alameda Island and surrounding waters). Based on a review of boring logs for IR Site 30, GSU agrees with this statement. However, this statement conflicts with statements in Section 5.1.2 (Distribution of Contaminants) and Section 6.1.1 (Conceptual Site Model) that suggest that this imported fill occurs within the upper 0 to 2 feet bgs. **Please clarify.**

    The following paragraph states that there is a laterally continuous layer of clay beneath IR Site 30, which varies in thickness across the site. It goes on to state that this clay layer is an important physical barrier that potentially restricts vertical vapor migration from the shallow groundwater. Based on a review of lithologic logs from IR Site 30, GSU agrees that there is a predominance of clay in many locations at IR Site 30. However, GSU disagrees that the lateral continuity of the clay has been demonstrated (see General Comment C). **Please modify or remove any statements regarding the lateral continuity of the clay including the statement that it is an important physical barrier to vertical vapor migration, as this has not been demonstrated and cannot be supported by the current data set.**

    Finally, it is stated in the last sentence in the third full paragraph on page 2-4 that boring logs from the RI activities were used to create the cross-sections. However, boring logs from the PAH Study (BEI, 2004) were also used. **Please correct this statement and provide a reference to the earlier report.**

12. Section 2.4.2 – Alameda Point and IR Site 30. In the last paragraph on page 2-6, it is stated that groundwater at IR Site 30 is typically encountered at 4 to 8 feet bgs, which correlates to a water table elevation of 4 to 6 feet above mean sea level (MSL). This information is consistent with the elevation data presented on the areawide groundwater elevation maps for summer and winter 2003 (Figures 2-13 and 2-14, respectively). However, more recent data are available (spring 2004) which show the water table elevation at IR Site 30 to be high as 7 feet MSL (Shaw, 2004). **Please include the most current water level data from the Basewide Groundwater Monitoring Reports (Shaw, 2004 and 2005) in the RI report. Please also consider providing a description of the range of water table fluctuations based on seasonal data available for the areawide groundwater.**

    It is further stated in this section that the potentiometric surface for the semiconfined second water bearing zone (SWBZ) is approximately 3 to 4 feet MSL based on water level measurements in nearby well D-02. It is unclear how a potentiometric surface for the SWBZ can be determined using a single data point (well D-02). In addition, the first full sentence on page 2-7 states that the SWBZ is confined in the vicinity of IR Site 30. **Please provide more information regarding water level elevation data and vertical gradients to support the determination that the SWBZ is confined.**

13. Section 3.2 – Sampling Locations, Analyses, and Rationale. It is stated in the last paragraph of this section that no soil gas samples were collected during the RI because groundwater at IR Site 30 is encountered between 4 and 5 feet bgs. However, at the bottom of page 2-6 it is stated that groundwater is typically encountered at 4 to 8 feet bgs. On Table 3-2 it is stated to be generally 4 to 7 feet bgs (see footnote c), and sometimes 4 feet or shallower (see footnote e). The depth to groundwater is an important input parameter for the J&E model (see General Comment B). **Please clarify.**

14. Section 3.2.1 - Soil Sampling. It is stated in the last paragraph on page 3-3 that nine vadose zone soil samples were collected and analyzed for geotechnical parameters and that these parameters were used as input to the J&E model to estimate potential exposure point concentrations in indoor air at the site. However, the information contained in Attachment I3 of Appendix I indicates that default values (U.S. EPA, 2003) were used rather than site-specific values for most of the geotechnical parameters. **Please describe why default values were used rather than site-specific values, or revise the model to include site-specific values. Also, please provide the criteria that were used to select the geotechnical samples for analysis.**

15. Section 4.1.1.1 – Remedial Investigation. In the first paragraph on page 4-2 it is stated that 60 soil samples were analyzed for VOCs and 47 soil samples were analyzed for SVOCs, pesticides, PCBs, and metals. In the following paragraph it is stated that 67 soil samples were analyzed for VOCs and 51 soil samples were analyzed for SVOCs, pesticides, PCBs, and metals. Is this apparent discrepancy related to the inclusion of duplicate samples in the numbers provided in the second paragraph? **Please clarify this apparent discrepancy. The same apparent discrepancy occurs in the information presented on Tables 1-1 and 3-2. Please modify the footnotes on the tables to clarify.**

16. Section 4.1.1.1 – Remedial Investigation. In the third and fourth paragraphs on page 4-2, the distribution of samples and analytical suites by depth is described. Analytical suites vary with depth, and GSU found it difficult to determine the spatial distribution of samples/analytical suites by depth interval. GSU finds the depiction of samples and analytical suites presented on Figure 4-1 to be very useful, but would prefer to see the information presented by depth interval (i.e. 0-2 feet bgs, 2-4 feet bgs, and 4-10 feet bgs). This information is nicely outlined on Table 3-2, but Figure 4-1 does not provide borehole numbers, so it is difficult to correlate the information. **Please consider providing maps of sample locations and analytical suites by depth interval.**

17. Section 4.1.2.1 – Volatile Organic Compounds. Fifteen VOCs have been detected in soil samples collected from IR Site 30. These VOCs were typically detected at low concentrations (below residential soil PRGs) and infrequently (in 10 percent or less of the samples). While GSU agrees that these VOCs were generally detected below levels of concern (i.e. they were well below residential soil PRGs), the probable source of these VOCs in soil at IR Site 30 is not explained. Does the distribution indicate that historical activities at IR Site 30 have contributed these chemicals to soil, or are they related to the areawide groundwater plume? **Please consider adding a subsection under Section 4.1.3 (Nature and Extent of Soil Contamination) to discuss the distribution and probable source of VOCs in soil at IR Site 30. It would be useful to include the map (Figure K-1) from Appendix K in the main body of the RI report to illustrate the distribution of VOCs in soil.**

18. Section 4.1.2.2 – Polynuclear Aromatic Hydrocarbons. It is stated in this section that the PAH analytical results for many of the samples collected from IR Site 30 were reported by the laboratory at an SQL that exceeded applicable federal or California PRGs. It goes on to say that the data collected during the 2002 and 2003 PAH investigations are sufficient to characterize the distribution of PAHs in soil at IR Site 30. GSU agrees that 200 samples from these two investigations should be sufficient to characterize PAHs at IR Site 30. However, more information regarding detection limit exceedences needs to be provided in the RI report. **Please summarize the numbers of samples with detection limits**

exceeding the TQLs and residential soil PRGs, and the percentage of affected data by analyte. GSU cannot fully evaluate the discussion presented in this section without this information.

19. Section 4.1.2.3 – Other Semivolatile Organic Compounds. It is stated that a number of SVOCs had detection limits reported by the laboratory between 400 and 55,000 µg/kg, which exceeded some of the applicable federal or California PRGs. It goes on to say that, because the MDLs for these samples are below their respective PRGs, and the laboratory did not report any of these constituents as detected between the SQL and the MDL, the conclusion that these constituents are not present is supported. GSU disagrees that the data with elevated detection limits are acceptable to characterize the nature and extent of contamination at IR Site 30, and to be used in the risk assessment. **Please include a summary of the numbers of samples with detection limits exceeding the TQLs and residential soil PRGs, and the percentage of affected data by analyte. GSU cannot fully evaluate the discussion presented in this section without this information. Please also explain what data gaps may have been created by this problem.**

20. Section 4.1.2.4 – Pesticides and Polychlorinated Biphenyls. It is stated that analytical results for two pesticides, aldrin and dieldrin, were reported as not detected at a level exceeding their federal residential soil PRGs in 13 and 49 samples, respectively. It goes on to say that, because the MDLs for these samples are below their respective PRGs, and the laboratory did not report any of these constituents as detected between the SQL and the MDL, the conclusion that these constituents are not present is supported. In addition, it is stated that SQLs for PCBs, in particular Aroclor 1254, were elevated above the federal residential soil PRGs. It goes on to say that, because the MDLs for these samples are below their respective PRGs, and the laboratory did not report any of these constituents as detected between the SQL and the MDL, the conclusion that these constituents are not present is supported. GSU disagrees that the data with elevated detection limits are acceptable to characterize the nature and extent of contamination at IR Site 30, and to be used in the risk assessment. **Please include a summary of the numbers of samples with detection limits exceeding the TQLs and residential soil PRGs, and the percentage of affected data by analyte. GSU cannot fully evaluate the discussion presented in this section without this information. Please also explain what data gaps may have been created by this problem.**

21. Section 4.1.3 – Nature and Extent of Soil Contamination. GSU cannot fully evaluate the nature and extent of soil contamination without supporting information regarding detection limit problems identified for PAHs, other SVOCs, pesticides, and PCBs described in Sections 4.1.2.2, 4.1.2.3, and 4.1.2.4 (see General Comment A).

22. Section 4.2.4.3 – Additional Chemicals. One purpose of collecting groundwater data from IR Site 30 was to assess whether the chemicals in groundwater are consistent with those in the areawide plume, or whether a site-specific release of contaminants had occurred. A distinct analysis of groundwater data from IR Site 30 for benzene and naphthalene has been made relative to the areawide groundwater plume. However, the same rigor was not applied for additional constituents detected in groundwater samples collected from IR Site 30. It is the opinion of GSU that it has not been demonstrated that other VOCs, PAHs and metals detected in shallow groundwater are not the result of on-site releases.

    The discussion of additional chemicals reported in groundwater samples focuses only on those that were found above screening criteria. However, it is the opinion of GSU that a comparison to screening criteria is not useful when trying to evaluate the source of the contaminants. In order to evaluate the source of groundwater contaminants, a comparison of chemicals detected in soil with chemicals detected in groundwater should be made, along with a demonstration of the consistency of these chemicals with levels reported in the areawide plume.

    GSU requests that an evaluation of the analytical data for all constituents detected in groundwater that were also found in soil at IR Site 30 be performed, and that a description of their relationship to the areawide groundwater plume be provided.

23. Section 5.1.2 – Distribution of Contaminants. It is stated in this section that arsenic concentrations exceeding the upper limit of Alameda Point background concentrations were generally limited to the 0-to-2-foot depth interval. It goes on to say that this distribution suggests that imported fill material may be the source of arsenic at this depth because the color and texture (yellowish-brown, clayey gravel) of the fill materials at depths of 0 to 2 feet bgs differ from the typical dredged fill materials encountered deeper. However, this interpretation of the subsurface materials encountered at IR Site 30 is inconsistent with the interpretation presented on page 2-4 which indicates that the imported fill materials were typically encountered in the first 3 to 6 feet bgs. In several locations at IR Site 30, the boring logs show that the yellowish-brown coarse-grained fill materials were encountered at depths of 3 to 6 feet bgs (see Specific Comment No. 11). **Please clarify.**

24. Section 5.2.3 – Fluctuating Groundwater Table. It is stated in the last sentence of this section that groundwater in the vicinity of IR Site 30 generally flows to the northwest and northeast toward the Oakland Inner Harbor. However, the areawide groundwater elevation maps presented in the RI report (Figures 2-13 and 2-14) and in the Basewide Groundwater Monitoring Reports (Shaw, 2004 and 2005) consistently show groundwater flowing toward the southwest on the

property immediately north of IR Site 30. In addition, groundwater flow directions on IR Site 30 have often been shown to have an east/west component. **Please clarify.**

25. Section 5.2.4 – Volatilization to Ambient Air. The last sentence of the first full paragraph on page 5-5 states that volatilization of VOCs in groundwater to soil appears to be limited, most likely due to the presence of the continuous clay layer extending the width of IR Site 30. GSU disagrees with the interpretation that there is a continuous clay layer extending the width of IR Site 30 (see General Comment C). **Please consider revising or removing this statement.**

26. Section 6.1.1 – Conceptual Site Model. It is stated in the first paragraph on page 6-2 that VOCs, SVOCs, pesticides, and PCBs were reported in 15 percent or less of the soil samples. However, the detection limits reported for several of the analytes in many of soil samples were elevated above TQLs and screening levels. It is the opinion of GSU that based on the prevalent problems with elevated detection limits, frequency of detection is not meaningful and should not be quantified (see General Comment A). **Please provide further information regarding the elevated detection limits to qualify any statements regarding frequency of detection, or remove them.**

27. Section 6.1.6.2 – Indoor Air Risk Characterization. It is stated in this section that most of the indoor air risk is associated with vapors from soil, as opposed to vapors from groundwater. It goes on to say that it is likely that these risks are overestimated. GSU questions the statement that risks may be overestimated for the following reasons.

    DTSC guidance indicates a strong preference for using soil gas data to perform these analyses due to uncertainties associated with soil and groundwater sampling methods and partitioning equations (*Interim Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*, DTSC, December 2004). However, at IR Site 30 soil gas data have been deemed unreliable because of the shallow groundwater table. Therefore, the BCT agreed that soil matrix and groundwater data would instead be used as input to the model. DTSC guidance states that soil matrix data are less than ideal for evaluating vapor intrusion risk because of the uncertainty associated with using portioning equations and the potential loss of VOCs during sample collection. DTSC guidance also indicates a preference for groundwater samples to be collected with bladder pumps or submersible pumps rather than bailers due to the potential for volatile losses that may result in an underestimation of risk. It should be noted that the methods used to collect data as input for the J&E model are less than ideal, and it is likely that risks were underestimated.

Please provide further justification for the statement that risks are likely overestimated, or remove it.

28. Section 7.1 – Conclusions. Due to persistent problems with elevated detection limits for several of the analytes evaluated as part of this soil RI, it is the opinion of GSU that there may be data gaps at IR Site 30. Until the detection limit problems can be better characterized and/or resolved, GSU cannot agree with the conclusions and recommendations presented in the RI report (see General Comment A).

If you have any questions, please feel free to contact me at (510) 540-3926 or at mdalrymp@dtsc.ca.gov.

Department of Toxic Substance Control

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MEMORANDUM

TO: Marcia Liao, DTSC Project Manager
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Berkeley, CA 94704

FROM: James M. Polisini, Ph.D.
Staff Toxicologist, HERD
1011 North Grandview Avenue
Glendale, CA 91201

DATE: April 28, 2005

SUBJECT: NAVAL AIR STATION ALAMEDA (ALAMEDA POINT) DRAFT SITE 30 REMEDIAL INVESTIGATION REPORT
[SITE 201209-18 PCA 18040 H:49]

BACKGROUND

HERD reviewed the document titled *Draft Soil Remediation Investigation Report, IR Site 30, Alameda Point, Alameda, California,* dated March 2005. This Remedial Investigation (RI) Report was prepared by Bechtel Environmental, Inc. of San Diego, California. This review is in response to your April 4, 2005 Groupwise electronic listing of the Site 30 Draft RI Report as one of the two highest HERD priorities for Naval Air Station (NAS) Alameda.

Site 30 is a 6.6 acre site at the eastern end of NAS Alameda (Alameda Point) completely surrounded by other Installation Restoration (IR) sites. IR Site 25 is immediately to the north, IR Site 25 is immediately to the east and IR Site 31 is immediately to the south and west. Site 30 was created by filling tidelands and sloughs from the early 1900s through the 1930s. In the 1950s the site was paved and used for storage of equipment and undocumented materials. A large area-wide Volatile Organic Compound (VOC) groundwater plume exists in the shallow groundwater beneath IR Site 25 and the Fleet Industrial Supply Center (FISC) Annex IR Site 02. This groundwater plume is primarily dissolved-phase benzene and naphthalene. IR Site 30 is currently occupied by a temporary structure and two buildings housing the Woodstock Child Development Center and the George P. Miller Elementary School.

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Some unpaved areas remained until recently in the play areas surrounding the Woodstock Child Development Center and other play areas to the east and west of the George P. Miller Elementary School. Unpaved areas in the southwest portion of the Woodstock Child Development Center have recently been covered with materials that include synthetic turf, sand, liners and wood chips. The previously unpaved areas east of the George P. Miller Elementary School have been paved. After a Time Critical Removal Action (TCRA), 74 percent of the land area at Site 30 is hardscape.

NAS Alameda was an active naval facility from 1940 to 1997. Operations included aircraft, engine, gun and avionics maintenance; fueling activities; and metal plating, stripping and painting. An unconfined landfill exists on the margin of San Francisco Bay in the western bayside area of NAS Alameda. In addition to skeet range activities, linked storm water and industrial wastewater lines discharged to the Seaplane Lagoon in the Northwest and Northeast corners, as well as the Oakland Inner Harbor Channel side of NAS Alameda.

GENERAL COMMENTS

The process for selecting contaminants to carry forward in the Human Health Risk Assessment (HHRA) incorporates residential Preliminary Remediation Goals (PRGs) as screening criteria. PRGs are meant for identification of sites for No Further Action (NFA). However, inclusion of all detected elements or compounds will not affect the primary contributors to human risk and/or hazard identified in this Human Health Risk Assessment.

SPECIFIC COMMENTS

1. Volatile Organic Compound (VOC) analysis for soil samples was performed on one-third (11) of the soil samples in the 0-to-2-foot-bgs soil interval (Section 3.2.1, page 3-2). The rationale, reportedly contained in the work plan, is that VOCs would not be expected at high concentrations in the surface interval due to their high vapor pressure. While all the 0-to-2-foot-bgs VOC samples were taken around the child center and the school, the lack of site-coverage is a limitation which should be considered when evaluating the results of the Human Health Risk Assessment (HHRA). This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractors.

2. Chemical analysis for Semivolatile Organic Compounds (SVOC), pesticides, polychlorinated biphenyls (PCBs) and inorganic elements was performed on all soil samples in the 0-to-2-foot-bgs soil intervals, but on only one-third of the soil samples in the 2-4-foot-bgs and 4-10-feet-bgs soil intervals (Section 3.2.1, page 3-3). Any construction worker scenario for the HHRA will suffer severe data limitations due to this decision. This issue can be addressed in the Feasibility Study (FS) which is recommended by the Navy.

3. As a point of historical record, HERD never agreed to point estimates of inorganic element 'ambient' concentrations developed from the data set for areas designated as pink, blue and yellow as indicative of an 'ambient' soil concentrations in these areas (Section 3.5, page 3-7). HERD has repeatedly requested an electronic copy of the data set referenced for soils (PRC, 1997; Tetra Tech EM, Inc., 2001) for independent evaluation, but has yet to receive an electronic copy. The Draft Final RI Report for Operable Unit 1 (OU1) contained a section with statistical tests of OU1 site-specific soil concentrations to 'ambient', but the electronic copy referenced in the OU1 text (Volume II, Appendix E) was not furnished. Please forward an electronic copy of the 'ambient' soil data set for the pink, blue and yellow areas in an excel-readable format to HERD.

4. U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) are intended to screen sites not Contaminants of Potential Concern (COPCs), using the methodology provided in the full EPA PRG document (EPA, 2004). For several NAS Alameda reports, HERD agreed with the Navy contractors that PRGs could be used to screen potential COCs AS LONG AS NO MORE THAN 10 CARCINOGENS OR NON-CARCINOGENS WERE SCREENED OUT AND THE SCREENING VALUE WAS ONE TENTH THE PRG. This is a NAS Alameda specific exception to standard HERD HHRA guidance (HERD, 1994) that PRGs are for screening sites, not to screen COPCs. Please review the COPCs which were removed (Section 3.5, page 3-7) based on detections less than the PRG, but would remain in the HHRA based on the criterion HERD agreed to and provide an estimate of the change in risk and/or hazard that results in the HHRA for carcinogens and non-carcinogens.

5. Selected chemical concentrations in soil (Section 4.1.3, pages 4-7 through 4.18) and groundwater Section 4.2, page 4-18 through 4-24) discussed in the text were checked against the concentrations listed in tables (Tables 4-1 through 4-4) and were found to agree where checked. This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractor.

6. U.S. EPA Region 9 PRGs and California-modified U.S. EPA Region 9 PRGs for those compounds and elements exceeding the Target Quantitation Limits (TQLs) in soil (Table 3-6 and Table 4-1) were checked at random. Those checked were found to be arithmetically correct (EPA, 2004). This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractors.

7. The listing of Contaminants of Concern (COCs) in soil (Table 4-2) does not include elements or compounds which were detected at a substantial fraction of the PRGs (Table 4-1). As an example of the result of using PRGs as an inclusive selection criteria for Contaminants of Concern (COCs), the list of COCs in soil (Table 4-2) does not include:

Contaminants of Potential Concern (COPCs) not carried forward (Table 4-2)	Maximum Detected (µg/kg)	EPA Residential PRG (µg/kg)	California-modified Residential PRG (µg/kg)	Fractional Hazard Quotient
bis(2-ethylhexyl)phthalate (ca)	17000	35000		0.49
antimony (nc)	17.9	31		0.58
barium (nc)	1670	5400		0.31
nickel (nc)	754	1600		0.47
thallium (nc)	1.9	5.2		0.37
ca = cancer effects nc = non-cancer effects + Naphthalene included in HHRA despite not exceeding screening criteria (Section 4.1.3.1)				

The incremental cancer risk for naphthalene is included in the residential use scenario (Table 6-5) as $1x10^{-5}$, based on a decision reported in the text (Section 4.1.3.1, page 4-8). Incremental cancer risk for 1,1,2,2-tetrachloroethane is also calculated for the residential scenario (Table 6-5) even though this compound does not appear in earlier tables as exceeding screening values (Table 4-2). Risk or hazard-based soil concentrations such as PRGs should be used only to screen sites, not to screen COCs. Inorganic elements which occur above site-specific ambient concentrations and organic compounds detected should be included in the screening level Human Health Risk Assessment (HHRA), for the reasons outlined in the table above.

8. The column heading for the screening criteria listed for comparison to groundwater concentrations (Table 4-4) listed as 'Federal Tap Water PRG' should be amended to 'U.S. EPA Region 9 Tap Water PRG'. Many other U.S. EPA Regions develop region-specific tap water concentrations. The column heading listed as 'California Tap Water PRG' should be amended to 'California-modified U.S. EPA Region 9 Tap Water PRG'. Similar column heading changes should be made to summary tables (Table 4-5) using the same screening values.

9. U.S. EPA Region 9 PRGs and California-modified U.S. EPA Region 9 PRGs for those compounds and elements reported in groundwater (Table 4-4) were checked at random. Those PRGs checked were found to be the correct values (EPA, 2004). This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractors.

10. A groundwater COPC, 1,2-dichloroethane, is listed as exceeding the California risk-based water concentration as well as the California and Federal Maximum Contaminant Level (MCL) (Table 4-5). This compound does not appear in the presentation of COPCs in groundwater (Table 4-4). In addition to 1,2-dichloroethane, methylene chloride, benzo(a)anthracene and indeno(1,2,3-cd)pyrene are listed as groundwater analytes exceeding screening values (Table 4-5), but do not appear to be listed as detected in groundwater (Table 4-4). The

listing of COPCs for soil and groundwater (Table 6-1) does not list 1,2-dichloroethane, benzo(a)anthracene nor indeno(1,2,3-cd)pyrene as groundwater contaminants. Please correct all groundwater tables so that they are accurate and agree.

11. While pavement may inhibit and reduce infiltration of rainfall or irrigation water, up to 80 percent of rainfall can infiltrate through pavement (Attachment A). The point of presenting this material is to indicate that infiltration may be a more significant transport mechanism for soil contaminants to shallow groundwater. An assessment should always be made of common geographical patterns of soil contamination and groundwater contamination, especially in areas with shallow groundwater.

12. The total cancer risk estimates presented in the text (Section 6.1.5, pages 6-7 and 6-8) were checked against the tables (Table 6-2 through 6-10) and found to agree. This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractors.

13. The EPA estimate of incremental cancer risk for ingestion of soil and dermal contact with soil for hypothetical child receptor at the Woodstock Child Development Center (Section 6.1.5.4, page 6-10) is listed as $1x10^{-5}$ while the referenced table (Table 6-10) indicates an estimate of $3x10^{-5}$. Please amend these entries so that they are accurate and agree.

14. The EPA and CalEPA estimates of incremental cancer risk for inhalation of particulates and vapors in outdoor air for a hypothetical child receptor at the Woodstock Child Development Center (Section 6.1.5.4, page 6-10) list $1x10^{-8}$ and $7x10^{-8}$ respectively, while the referenced table (Table 6-10) indicates $7x10^{-8}$ and $2x10^{-7}$. Please amend these entries so that they are accurate and agree.

15. The more health protective of the standard CalEPA or Office of Environmental Health Hazard Assessment (OEHHA) school site model cancer risk estimates (Section 6.1.5.4, page 6-10) should be used when evaluating remedial alternatives in the Feasibility Study (FS) (Section 7.2, page 7-3).

16. HERD disagrees with the statement that '...current exposures are typically based on 0-to-2=foot depth intervals' (Section 6.1.5.4, page 6-10) as representative of all risk assessments for soil at NAS Alameda. All residential future use (i.e., unrestricted use) scenarios utilize soil concentrations from the surface to 10 feet or the surface to groundwater, whichever is less. This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractors.

17. The Hazard Indices (HIs) for the noncancer hazard contained in the text (Section 6.1.5.5, page 6-11) are those presented in the relevant tables (Table 6-3). This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractors.

18. Please list the Rare, Threatened or Endangered (RTE) species which occur within reasonable range of Site 30. The 'barren and urban' habitat at Site 30 can then be invoked, where appropriate, for concluding that the probability of significant use of Site 30 by these RTE species is low.

19. Please provide more detail in the text regarding the development of the initial list of Contaminants of Potential Ecological Concern (COPEC) values contained in the referenced table (Table 6-11). It would appear that one half the detection limit was used, for samples listed as non-detect, to develop the mean values presented, otherwise mean soil concentrations greater than the maximum soil concentration (e.g., 2,4-dinitrotoluene with a maximum of 19 µg/kg and a mean of 679.10 µg/kg) are not logical.

20. HERD agrees that the inhalation and dermal exposure pathways are 'not readily estimated or evaluated for ecological receptors' (Section 6.2.1.5, page 6-18). However, HERD does not agree that '...exposure by ingestion is assumed to be more likely than exposure by direct contact or inhalation', as stated in the same sentence. Inhalation and/or dermal exposure have the potential to be more significant for fossorial or aquatic vertebrate organisms and HERD has required assessment of these pathways at sites where the Conceptual Site Model (CSM) indicates fossorial receptors are protected or listed or significant components of the biological community. Please amend the last portion of the sentence to indicate that '...exposure by ingestion is assumed to be a more significant contributor to total exposure than exposure by direct contact or inhalation.'

21. Please provide further justification for using the minimum body weight (BW) for the vertebrate receptors (Section 6.2.3.2, page 6-20) assessed in the Ecological Risk Assessment (ERA). Mean or upper confidence limit estimates of the mean (i.e., 95 percent upper confidence limit on the mean) are the most commonly-used estimates of BW used in ERAs.

22. Please indicate in the text (Section 6.2.4, page 6-20) and in the heading of the referenced table (Table 6-2) whether the Hazard Quotients (HQs) presented and discussed are HQs calculated using the numerically-low Toxicity Reference Value (TRV) (a no effect level) or the numerically-high TRV (a probable effect level).

23. HERD agrees that no further refinement of the ERA is required for Site 30 based on the current use and the low probability that significant ecological habitat will

develop at Site 30. However, the potential ecological hazard remaining in the refined ERA should be a factor in evaluating the remedial alternatives in the proposed Feasibility Study (FS) (Section 7.2, page 7-3).

CONCLUSIONS

Based on the site characterization data presented, the Human Health Risk Assessment (HHRA) presented in this draft document accurately identifies the risk drivers (i.e., those contaminants contributing the maximum amount of cancer risk or non-cancer hazard). The screening process used for selection of the contaminants carried into the HHRA uses a comparison to Preliminary Remediation Goals (PRGs) which HERD has repeatedly rejected. All contaminants which are detected, with the exception of inorganic elements below 'ambient' concentrations and essential micronutrients at non-toxic concentrations, should be carried through the HHRA. Given that the recommendation in to proceed to Feasibility Study (FS), there minor changes in the HHRA will increase the total cancer risk and non-cancer hazard some unknown amount, but will not affect the recommendation to proceed to FS.

The potential ecological hazard described in the ERA should be considered in evaluating remedial alternatives in the FS. Protection of ecological receptors, given the current refined screening status of the ERA, is dependent on maintaining in the current lack of significant habitat.

HERD is currently waiting for the Navy delivery of an electronic copy of the NAS Alameda 'ambient' data set to determine inorganic element 'ambient' soil concentrations acceptable to HERD. The results of this assessment, should the Navy deliver the 'ambient' data set, will be reported in a separate memorandum.

REFERENCES

U.S. Environmental Protection Agency. 2004. U.S. EPA Region 9 Preliminary Remediation Goals. U.S. EPA Region 9 Headquarters, San Francisco, California.

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Tetra Tech EM Inc. 2001 Summary of Background Concentrations in Soil and Groundwater, Alameda Point, Alameda, California. November.

R. Pitt, M. Lilburn. S.R. Durrans, S. Burian, S. Nix, J. Vorhees, and J. Martinson. Guidance Manual for Integrated Wet Weather Flow (WWF) Collection and Treatment Systems for Newly Urbanized Areas (New WWF Systems). U.S. Environmental

Protection Agency, Urban Watershed Management Branch, Edison, New Jersey. December 1999. (Excerpted from Appendix A). (http://unix.eng.ua.edu/~rpitt/Publications/BooksandReports/Design%20for%20the%20Future/DesignforFuture.htm).

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Attachment A – Relationship of rainfall amount to runoff amount in residential areas with paved surfaces.

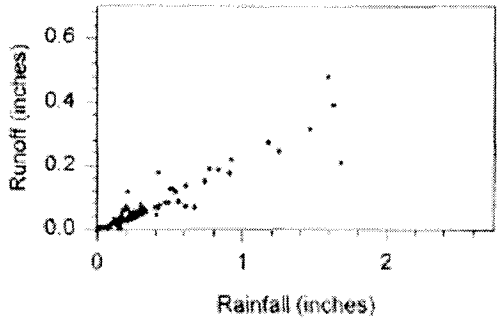

Figure A-1. Runoff vs. rainfall.

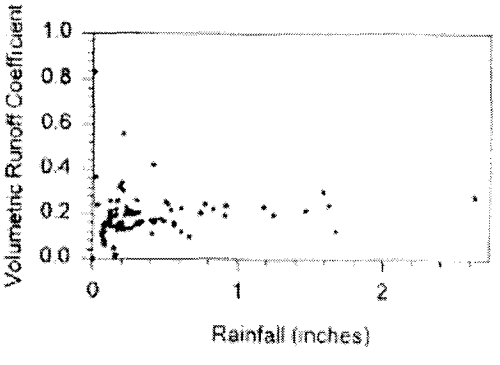

Figure A-2. Rv vs. rainfall.

[Text extract from Pitt, et al., 1999 referring the graphs presented above]

The plots of rainfall versus the volumetric runoff coefficient plot (Figure A-2) shows the ratio of the runoff volume, expressed as depth for the watershed, to rain depth, or the Rv, for different rain depths. This is a related plot to the one described above. If the Rv ratio was constant for all events, the rainfall versus runoff depth plot described above, would indicate a straight diagonal line, with no scatter. It is typically assumed that the above described relationship would indicate increasing Rv values as the rain depth increased. Figure A-1 shows a slight upwards curve with increasing rain depths. This is due to the rainfall losses making up smaller and smaller portions of the total rainfall as the rainfall increases, with a larger fraction of the rainfall occurring as runoff. The plot of Rv versus rainfall (Figure A-2) would therefore show an increasing trend with increasing rain depth. In most cases, the plots of actual data indicate a large (random?) scatter, making the identification of a trend problematic. The use of a constant Rv for all rains may also be a problem because of the large scatter. In many cases, the long-term average Rv for a residential area may be close to the typically used value. In Figure A-2, the values appear to center about 0.2 (somewhat smaller than the typically used value of about 0.3 for medium density residential areas), but the observed Rv values may range from lows of less than 0.04 to highs of greater than 0.5, especially for the smallest rains. The small rains probably have the greatest measurement errors, as the rainfall is much more variable for small rains than for larger rains, plus very low flows are difficult to accurately measure. Obviously, understanding what may be causing this

scatter is of great interest, but is difficult because of measurement errors masking trends that may be present. In many cases, using a probability distribution to describe this variation may be the best approach.